National Institute of Environmental Health Sciences

Statistical modeling of valley fever data in Kern County, California

Author(s): Talamantes J, Behseta S, Zender CS
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Abstract:

Coccidioidomycosis (valley fever) is a fungal infection found in the southwestern US, northern Mexico, and some places in Central and South America. The fungus that causes it (Coccidioides immitis) is normally soil-dwelling but, if disturbed, becomes air-borne and infects the host when its spores are inhaled. It is thus natural to surmise that weather conditions that foster the growth and dispersal of the fungus must have an effect on the number of cases in the endemic areas. We present here an attempt at the modeling of valley fever incidence in Kern County, California, by the implementation of a generalized auto regressive moving average (GARMA) model. We show that the number of valley fever cases can be predicted mainly by considering only the previous history of incidence rates in the county. The inclusion of weather-related time sequences improves the model only to a relatively minor extent. This suggests that fluctuations of incidence rates (about a seasonally varying background value) are related to biological and/or anthropogenic reasons, and not so much to weather anomalies.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution

Air Pollution: Other Air Pollution

Air Pollution (other): Airborne fungal spores

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Airborne Disease

Airborne Disease: Coccidioidomycosis (Valley Fever)

Model/Methodology:

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Short-Term (